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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,492	11/03/2003	John D. Brennan	571-886	3236

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EXAMINER

SKIBINSKY, ANNA

ART UNIT PAPER NUMBER

1631

DATE MAILED: 11/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/698,492	Applicant(s) BRENNAN ET AL.	
	Examiner Anna Skibinsky	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 4 and 22-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7 and 9-21 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Reply to Applicants

Regarding Restriction Requirements:

In the Office action mailed March 24, 2006, the election was made final following the applicant's traversal arguments. Additional traversal arguments are not germane to prosecution at this point. The Specie election requirement set forth in the Election/Restriction requirement is deemed proper.

Regarding 1.132 Declaration:

The declaration filed 7/24/2006 is sufficient to over come the 102(e) rejection by Zhang et al. (Pub No.: 2004/0249082).

Claim Rejections - 35 USC § 112-2nd paragraph

The rejection of claim(s) 1-3 and 5-21 for being Vague and Indefinite under 35 USC § 112-2nd paragraph in the Office Action filed March 24, 2006 is withdrawn in view of Applicant's Remarks/Amendments filed July 24, 2006

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

PRIOR ART REFERENCE 1

2. Claims 1-3, 9, 11-18 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Um et al. (Pub No. US2003/0124371; priority date Nov. 8, 2001).
3. The prior art of Um et al. teaches a surface-based DNA microarray where more than 100,000 different probe sequences can be bound to distinct special locations where each spot corresponds with a gene (paragraph 0002). The material taught in the prior art forms a network, i.e., a matrix. The prior art thus reads on claims 1 and 21.
4. As in instant claim 2, the prior art teaches polymeric hydrogels for immobilizing analytes, where hydrogels are a type of sol-gel (paragraph 0009).
5. As in instant claims 3 and 9, polyol silanes and bis-silanes are taught as components of the hydrogel (paragraphs 0133-0135)
6. As in instant claims 11-13, the prior art teaches two component hydrogel systems composed of crosslinked polymers and copolymers are taught (paragraph 0014), explaining that hydrogels are water-swellaable (paragraph 0017) and contain several moieties. The hydrogel has water absorbent layer that includes copolymers (paragraph 0019, lines 13-15; paragraph 0048; paragraph 0068, lines 13-14)
7. As in instant claims 14 and 15, a moiety composing the hydrogel may contain glycerol or polyethylene glycol (paragraph 0068, lines 27-29).
8. As in instant claims 16 and 17, the material forming the substrate includes glass or metals (paragraph 0097, lines 1-3 and lines 13-15; and paragraph 0122).

Art Unit: 1631

9. Instant claim 18 recites cleaning the glass as in Um et al. that teaches washing with water and buffer (paragraphs 0236-0238) as well as washing and drying (paragraph 0231).

PRIOR ART REFERENCE 2

10. Claims 1-3, 5-7, 16-18 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Preininger (Pub No. US2003/0040008; priority date April 12, 2000).

11. The prior art teaches immobilizing or binding analytes such as DNA, nucleic acids, proteins, peptides and enzymes and others to solid surfaces including biochips (paragraphs 0001, 0003, and 0017). Additionally, more biochips and microarrays for immobilizing DNA are taught (paragraphs 0020-0021). A variety of analytes are taught to attach to the surface in a spatially precise manner (paragraph 0030). Thus, the prior art teaches the limitations of claims 1 and 21.

12. As in instant claims 2-3 and 5-7 the prior art teaches arrays made of various polymeric silanes and dextrans (paragraph 0024). Additionally, dextrans as a hydrogel, a type of sol gel, is taught (paragraph 0024, lines 9-12).

13. As in instant claims 16 and 17, the surface of the material may be glass (paragraph 0018).

14. As in instant claim 18, Preininger teaches washing the substrate with hybridizing solution (paragraphs 0036 and 0038).

RESPONSE TO ARGUMENTS

Applicant's arguments filed 7/31/2006 have been fully considered but they are not persuasive.

1. Applicants argue that Um et al. do not teach the entrapment of two or more components of a protein based system within the hydrogel (Remarks, page 9, lines 7-8).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. entrapment of components within the hydrogel) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim 1 recites two or more components of a protein-based system entrapped therein, without specifically defining "protein-based". Page 12, lines 6-7, recite that "[t]he protein-based system **may be** any system involving a protein and any other component." The bioassays of Um et al. can be used in the study of proteins (col. 1, paragraph 2, lines 25-28) and further more, nucleic acids are the bases for encoding proteins so a "protein-based" sequence may be interpreted as one encompassing nucleic acids. They also entail a least two or more components that are attached (or entrapped) to the bioassay which is a copolymeric hydrogel, as stated in the above rejection.

2. Applicant's argue that the claimed invention is "based on co-entrapment of *two or more components of a protein based system*" and that Um et al. do not suggest a

microarray that co-entraps two or more components of a protein-based system
(Remarks, page 9, lines 11-17 of 7/31/2006).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Applicants do not recite "co-entrap[ment]" of components in the claims. Furthermore, Um et al. do teach a chips which are equivalent to microarrays while applicant's do not specify what is meant by "protein-based". Um et al. certainly teach "protein-based" systems whether the hydrogel chip is used to adhere proteins or genes, wherein genes can be interpreted as being a protein-based system.

3. Applicants argue that Preininger do not teach a microarray comprising a matrix having two or more components. Applicants further argue that Preininger does not teach or suggest a biomolecule-compatible microarray which co-entraps two or more components of a protein-based system.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Applicants do not recite "co-entrap[ment]" of components in the claims. Furthermore, as recited in the above reiterated rejection, Preininger does teach entrapped components of a protein based system as the prior art teaches proteins, enzymes etc., bound to surfaces which are matrix in nature such as synthetic surfaces or glasses (paragraphs 0017 and 0018).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-3, 5-7, 10, 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Preigninger as applied to claims 1-3, 5-7, 16-18 and 21 above, in view of Rubino (US Patent 6,584,259) and further in view of Ramsey (US Patent 6, 376, 181).

11. Preigninger teaches a sol gel matrix (Preigninger, paragraph 0024, lines 9-12) for the immobilization of biomolecules but does not teach preparation of the sol-gel using sodium silicate as required by claim 10. Rubino however teaches using sodium silicate to make glass sol-gel (col. 2, line 62 to col. 3, line 5).

12. Preigninger further teaches a glass microarray (Preigninger, paragraph 0018) for the immobilization of biomolecules but does not teach the modification of the glass microarray with glycidoxyaminopropyltrimethoxysilane (GPS), as required by claims 19 and 20 of the instant application. Ramsey et al. however teaches the modification of the glass microarray surface with GPS (col. 3, lines 55-65).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used sodium silicate as taught by Rubino et al. to make sol-gel as taught by Preigninger since Rubino et al. teaches the formation of sol-gel (col. 2, line 65-67). One of ordinary skill in the art would have been motivated to use sodium silicate as it is an ingredient in the formation of the sol-gel which is used in the microarray of Preigninger.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified the glass substrate surface of Preigninger with GPS as taught by Ramsey et al. One of skill in the art would have been motivated to use GPS because Ramsey et al. teach that oligonucleotides probes can be immobilized on glass surfaces with a linker such as GPS (col. 3, lines 5-65). Since Preigninger teaches the immobilization of nucleotides and biomolecules on the glass substrate with a linker (paragraphs 0015-0017), the modification of the glass with the GPS as taught by Ramsey et al. would be obvious.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 9- 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Um et al. as applied to claims 1-3, 9, 11-18 and 21 above, in view of Rubino (US Patent 6,584,259) and further in view of Ramsey (US Patent 6, 376, 181).

11. Um et al. teaches a sol gel matrix (Um et al., paragraph 0009) for the immobilization of biomolecules but does not teach preparation of the sol-gel using sodium silicate as required by claim 10. Rubino however teaches using sodium silicate to make glass sol-gel (col. 2, line 62 to col. 3, line 5).

12. Um et al. further teaches a glass microarray (Um et al., paragraph 0097, lines 1-3 and lines 13-15; and paragraph 0122) for the immobilization of biomolecules but does

not teach the modification of the glass microarray with glycidoxyaminopropyltrimethoxysilane (GPS), as required by claims 19 and 20 of the instant application. Ramsey et al. however teaches the modification of the glass microarray surface with GPS (col. 3, lines 55-65).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used sodium silicate as taught by Rubino et al. to make sol-gel as taught by Um et al. since Rubino et al. teaches the formation of sol-gel (Rubino et al., col. 2, line 65-67). One of ordinary skill in the art would have been motivated to use sodium silicate as it is an ingredient in the formation of the sol-gel which is used in the microarray of Um et al.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified the glass substrate surface of Um et al. with GPS as taught by Ramsey et al. One of skill in the art would have been motivated to use GPS because Ramsey et al. teach that oligonucleotides probes can be immobilized on glass surfaces with a linker such as GPS (col. 3, lines 5-65). Since Um et al. teaches the immobilization of biomolecules on the glass substrate with a cross-linker (paragraph 0077), the modification of the glass with the GPS as taught by Ramsey et al. would be obvious.

Objections

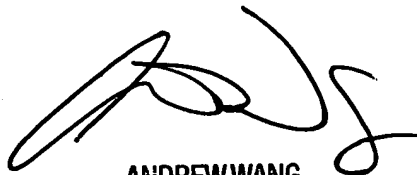
Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Skibinsky whose telephone number is (571) 272-4373. The examiner can normally be reached on 8 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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